

Utility Patent Application

CONFIDENTIAL INFORMATION

5 Patent Application based on: Docket No. 04-1431
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SLEEP SAFETY ALARM

RELATED APPLICATIONS

15 The present invention was first described in Disclosure Document Number
539,586 filed on October 7, 2003 under 35 U.S.C. §122 and 37 C.F.R. §1.14.

There are no previously filed, nor currently any co-pending applications, anywhere in
the world.

BACKGROUND OF THE INVENTION

1. Field of the Invention

20 The present invention relates generally to alerting devices for the hearing
impaired, and, more particularly, to a sound activated alarm blanket.

2. Description of the Related Art

As any home owner will attest, security is an area of primary concern. Due to the fact that people tend to place a high value on their property and personal safety, the marketplace has responded with a variety of products that are intended to protect one's life and property. Perhaps the most common of these products is the smoke alarm. Such alarms have undoubtedly saved countless lives since their use began. However, even if these smoke alarms are provided with flashing strobe lights, those who are deaf or hard of hearing are left completely unprotected while sleeping.

A search of the prior art did not disclose any patents that read directly on the claims of the instant invention; however, the following references were considered related:

U.S. Patent Number 6,377,177 discloses a baby blanket with baby monitoring system.

U.S. Patent Number 4,614,939 discloses a method and device for detection of a blanket or the like being kicked off the body of a sleeping person.

U.S. Patent Number 4,411,034 discloses a blanket device with alarm.

U.S. Patent Number 5,867,105 discloses a wireless alarm system.

U.S. Patent Number 5,912,624 discloses an infant's sleep time monitor.

U.S. Patent Number 6,285,289 discloses a smoke detector wrist kidnapper

alarm.

And, U.S. Patent Number 4,195,287 discloses a fire and absence detection and alarm system for bed occupants

Consequently, there is a need for a means by which those who are deaf or hard of hearing can be protected from the threat of fire while sleeping thus ensuring their safety.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an improved alerting devices for the hearing impaired.

It is a feature of the present invention to provide a sound activated alarm blanket.

Briefly described according to one embodiment of the present invention, a blanket for a bed with integral vibrating mechanisms to awaken a sleeper in the event of an emergency is disclosed. The invention is equipped with an audible sensor mechanism which will activate the vibrating mechanism upon detection of loud or high-pitched noises from a smoke alarm, a carbon monoxide (CO) alarm, a telephone, an alarm clock, a barking dog, breaking glass, and the like. An additional hard wired link allows for the connection of external devices such as weather alert radios, security alarm systems, fire alarm systems and the like. The

vibrating mechanisms, approximately 24 total per sleeping person, would vibrate in a similar fashion to that of a cell phone or pager. Their location would be such that no matter how the person was sleeping, several would be in direct contact with the sleeper. It is envisioned that the invention would be made available in multiple sizes, from a twin bed to king, to fit all sizes of beds. The invention is powered from a rechargeable battery pack ensuring operation of the invention in the event of a power failure. The invention is intended for those who are deaf, hard of hearing, or just find it difficult to awaken.

The use of the present invention provides a means of safely awakening even the soundest sleeper in the event of an emergency, allowing them adequate time to safely evacuate.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

FIG. 1 is an overall pictorial representation of the sound activated alarm blanket 10, according to a preferred embodiment of the present invention;

FIG. 2 is an isometric view of the control box 35, as used with the sound

activated alarm blanket 10;

FIG. 3 is a cutaway view of the vibrating blanket 20, depicting vibrating modules 25; and,

FIG. 4 is an electrical schematic depicting the major electrical components as used with the sound activated alarm blanket 10.

DESCRIPTIVE KEY

	10	sound activated alarm blanket	75	remote input terminals
	15	conventional bed	80	battery access cover
10	20	vibrating blanket	85	lower fabric layer
	25	vibrating modules	90	mounting flanges
	30	interconnecting cable	95	thread
	35	control box	100	bus wires
	40	enclosure	105	drop wires
15	45	wall mounted power supply	110	step down transformer
	50	power cord	115	diode bridge
	55	power switch	120	rechargeable battery pack
	60	power on indicator light	125	audio amplifier and analyzer
	65	test pushbutton	130	output signal
20	70	microphone		

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The best mode for carrying out the invention is presented in terms of its preferred embodiment, herein depicted within the Figures 1 through 4.

1. Detailed Description of the Figures

Referring now to FIG. 1, a pictorial representation of the sound activated alarm blanket 10 is depicted, according the preferred embodiment of the present

invention. A conventional bed 15 (or other suitable sleeping surface, such as a floor, inflatable mattress or couch, for example), is provided with a vibrating blanket 20, which covers the sleeping occupant of the conventional bed 15 during use, as would be conventionally expected. While the conventional bed 15 is shown as a double bed and appropriately sized blanket, it should be noted that the size of the conventional bed 15 and vibrating blanket 20 is not limited to any particular size, and as such, should not be a limiting factor of the present invention. A plurality of vibrating modules 25, are imbedded in the layers of the vibrating blanket 20. Said vibrating modules 25 are arranged in a grid pattern such that a quantity of twenty-four (24) vibrating modules 25 provide coverage for the individual sleeper. This quantity will provide a grid pattern with dimensions of approximately ten (10) to twelve (12) inches on center. This pattern will ensure that even though not all of the vibrating modules 25 will be in contact with the sleeping occupant of the conventional bed 15, multiple contacts about the torso and leg area will be made, no matter what position the occupant may be lying in. A total quantity of forty-eight (48) are shown in FIG. 1, due to the fact that a double bed is depicted, and as such, two people may be sleeping. The vibrating modules 25 are interconnected by imbedded cabling similar to that used in an electric heating blanket. An interconnecting cable 30 carries low voltage electrical power from a control box 35 to the vibrating blanket 20. The control box 35 receives input signals from external

audible and/or electrical stimuli, and generates a voltage that activates the vibrating feature of all vibrating modules 25. Such vibration is intended to awaken the sleeping occupant of the conventional bed 15 and to provide alerting functions to possible danger. Further definition of the vibrating modules 25 and the control box 35 will be provided herein below.

Referring next to FIG. 2, a detailed isometric view of the control box 35 is disclosed. The control box 35 provides an enclosure 40, envisioned to be made of plastic, and the approximate size of a common bed-side clock radio unit. As such, the control box 35 can sit on the floor near the conventional bed 15 (as shown in FIG. 1) or on a nearby bed-side table or night stand. The control box 35 receives its power from a wall mounted power supply 45 and a power cord 50, as is well-known in the art. The interconnecting cable 30, which carries low-voltage power to the vibrating blanket 20 (as shown in FIG. 1) exits the opposite side of the enclosure 40 as shown. A power switch 55 removes power supplied to the control box 35 during periods of non-use. A power on indicator light 60 indicates the presence or absence of electrical power by illumination or non-illumination respectively. Located next to the power on indicator light 60 is a test pushbutton 65 which allows the user to test the vibrating feature of the vibrating blanket 20 (as shown in FIG. 1). This features provides reassurance that the alerting mechanism of the sound activated alarm blanket 10 is fully operational. Located at the rear of the enclosure

40 is a microphone 70. The microphone 70 is used to detect abnormal, above ambient noises in the sleeping space that may not awaken the sleeper. Such noises include but are not limited to: a smoke alarm, a carbon monoxide (CO) alarm, a telephone, an alarm clock, a barking dog, breaking glass, and the like. Thus, should the sleeper be deaf, hard of hearing, or just a sound sleeper, the sound activated alarm blanket 10 will aid in awakening the sleeper in the event of an emergency, or abnormal situation. A set of remote input terminals 75 allows the user to hook up remote devices which would activate the sound activated alarm blanket 10. The remote input terminals 75 would accept a two-wire dry contact from external devices (stand-alone devices), including weather alert radios, security alarm systems, fire alarm systems, and other devices which typically provide such output signals. If more than one remote device is electrically coupled to the control box 35 via the remote input terminals 75, they may be wired in parallel, such that any one of the devices could provide activation without affecting the others. Finally, a battery access cover 80 provides user access to a rechargeable battery pack, envisioned to be a gel-based lead acid battery, similar to those used in consumer grade Uninterruptible Power Supplies (UPS). The internal battery pack allows the sound activated alarm blanket 10 to remain operational in the event of a power failure, thus providing complete protection for the user at all times.

Referring now to FIG. 3, a cutaway view of the vibrating blanket 20, depicting

a vibrating module 25 is shown. The vibrating module 25 is held captive between two layers of fabric of which a lower fabric layer 85 is shown for purposes of clarity. The vibrating module 25 is held in place by two or more mounting flanges 90 which are sewn to the lower fabric layer 85 by use of thread 95. The interior of the vibrating module 25 houses a simple direct current motor with an offset weight, which when activated, produces the vibrating effect. This procedure is well known in the art, and is used for vibrating mechanisms on wireless phones, pagers and the like. A set of bus wires 100 which carry the low-voltage direct current to all of the vibrating modules 25 in the vibrating blanket 20 (as shown in FIG. 1) are provided in a parallel arrangement as shown. A set of drop wires 105 in electrical contact with the bus wires 100 then carry the direct current to the vibrating module 25. The parallel connection as shown allows the remaining vibrating module 25 to remain operational should one or more of the vibrating module 25 become non-functional.

Referring finally to FIG. 4, an electrical schematic of the sound activated alarm blanket 10 is depicted. The wall mounted power supply 45 consisting of a step down transformer 110 and a diode bridge 115 transforms the high voltage alternating current normally furnished as part of a residential electrical system in a low-voltage direct current system as is well known in the art. The output of the diode bridge 115 then is connected across a rechargeable battery pack 120 to keep it in a charged state. This method of battery charging is depicted for sake of simplicity,

and other methods using regulating circuits, over current devices, rate-of-charge circuits, time based circuits and the like can be used equally as well and should not be interpreted as a limiting factor of the present invention. Power from the rechargeable battery pack 120 and the wall mounted power supply 45 is controlled by the power switch 55, which allows the features of the sound activated alarm blanket 10 to be deactivated thus allowing the vibrating blanket 20 (as seen in FIG. 1) to serve as a conventional blanket. Power is then applied to an audio amplifier and analyzer 125 which accepts the audio input from the microphone 70. After the audio signal is analyzed using well-known techniques for high-pitched or loud sound levels, an output signal 130 is generated which energizes the vibrating modules 25 in their parallel arrangement as shown. As aforementioned, the quantity of vibrating modules 25 will vary depending on the size of conventional bed 15 (as shown in FIG. 1) to be covered. The test pushbutton 65 is positioned across the output signal 130 so that it may be bypassed to allow the testing of the vibrating modules 25. In a similar manner, the remote input terminals 75 are wired in a parallel manner across the test pushbutton 65, so that in the event of a contact closure from an outside source the vibrating modules 25 will be energized. Finally, the power on indicator light 60 is connected to the power switch 55 to indicate when power is applied to the sound activated alarm blanket 10.

It is envisioned that other styles and configurations of the present invention

can be easily incorporated into the teachings of the present invention, and only one particular configuration shall be shown and described for purposes of clarity and disclosure and not by way of limitation of scope.

2. Operation of the Preferred Embodiment

5 The preferred embodiment of the present invention can be utilized by the common user in a simple and effortless manner with little or no training. After purchase or procurement of the sound activated alarm blanket 10, the vibrating blanket 20 is laid out upon the conventional bed 15 in a conventional manner. It should be used right above the top sheet on the conventional bed 15, such that
10 additional blankets, comforters, quilts, bed spreads, and the like will not reduce the vibrating effect from the vibrating modules 25 upon the user's torso or leg area. Next, the user would plug the wall mounted power supply 45 into a suitable source of electrical power. Then the power switch 55 would be closed and verified by illumination of the power on indicator light 60. Finally, the user would test the
15 operation of the sound activated alarm blanket 10 by pressing the test pushbutton 65 and verifying the vibration of the vibrating modules 25 on the vibrating blanket 20. Should any external wiring such as from a weather alert radios, security alarm systems, fire alarm systems, and the like be required, it would be connected to the remote input terminals 75. At this point the sound activated alarm blanket 10 is
20 ready for use.

During the actual use of the sound activated alarm blanket 10 the user or sleeper would sleep in the conventional bed 15 and cover themselves with the vibrating blanket 20 in a normal and expected manner. During the night or while sleeping, should a smoke alarm, a carbon monoxide (CO) alarm, a telephone, an alarm clock, activate, or the sound of a barking dog or breaking glass occur, the control box 35 will send an electrical signal along the interconnecting cable 30 to the vibrating blanket 20 causing all vibrating modules 25 to vibrate and awaken the user, who can then take appropriate action.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the Claims appended hereto and their equivalents. Therefore, the scope of the invention is to be limited only by the following claims.